

What is claimed is:

1. A system for managing at least one data object in a network comprising:
  - a plurality of storage locations, each of said storage locations capable of storing a copy of the data object;
  - a data manager for creating a copy or moving a copy of said data object to one of said storage locations; and
  - a counter for indicating a minimum number of storage locations in the network containing the data object,wherein the data manager maintains the data object at the minimum number of storage locations in the network based on the counter.
2. The system of claim 1 wherein each of said storage locations in the network possesses at least one attribute and is configured to determine a function based on said attribute.
3. The system of claim 2 wherein the attribute comprises a geographic location.
4. The system of claim 2 wherein the function comprises a distance between said storage locations in the network.
5. The system of claim 1 wherein each storage location comprises a computer memory.
6. The system of claim 1 further comprising a data request component for receiving a data request from a site and for transferring the data object to a storage location within a predetermined distance of said site.
7. The system of claim 1 wherein the data manager includes storage location information.

8. The system of claim 7 wherein the storage location information comprises at least one of a storage space data, size of data objects, last accessed time of data objects, number of accesses of data objects, or local geographic information.
9. A method of managing a data object in a network comprising:
- receiving the data object;
  - determining a minimum distance between a plurality of storage locations in a network;
  - selecting at least one storage location based on the minimum distance;
  - creating a plurality of copies of the data object; and
  - storing each copy of the plurality of copies of the data object at a selected storage location in the network.
10. The method of claim 9 wherein the plurality of copies comprises at least  $n$  copies of the data object,  $n$  being a desired minimum number of copies of the data object.
11. The method of claim 9 wherein said creating comprises:
- determining  $n$ ,  $n$  being a desired minimum number of copies of the data object; and
  - forming at least  $n-1$  copies of the data object.
12. A method of managing a data object in a network comprising:
- determining the number of a plurality of storage locations in the network each containing a copy of the data object;
  - obtaining a desired minimum number of copies of the data object; and
  - storing a copy of the data object at a selected storage location in the network if the actual number of copies of the data is less than the desired minimum number,
- wherein the selected storage location is separated by at least a distance  $d$  from at least one other storage locations in the network containing a copy of the data object,  $d$  being a predetermined minimum distance.

13. The method of claim 12 further comprising the step of calculating the predetermined minimum distance  $d$ .
14. The method of claim 13 wherein said calculating step comprises determining the geographic location of the storage location.
15. A method of managing a data object in a network comprising:
- receiving a modified data object;
  - determining which of a plurality of storage locations contains the data object;
  - obtaining a minimum number of storage locations containing the data object; and
  - replacing each data object at each storage location with the modified data object such that at least the minimum number of storage locations contain the modified data object and each storage location containing the modified data object is separated by at least  $d$ ,  $d$  being a predetermined minimum distance.
16. The method of claim 15 further comprising the step of calculating the predetermined minimum distance  $d$ .
17. The method of claim 16 wherein said calculating comprises determining the geographic location of the storage location.
18. A method of managing a data object in a network comprising:
- determining an actual number of a plurality of storage locations in the network that each contain a copy of the data object;
  - obtaining a maximum number of copies of the data object; and
  - deleting a copy of the data object from a storage location if the actual number of copies of the data is greater than the maximum number of copies of the data object.

19. The method of claim 18 wherein the maximum number of copies of the data object is equal to  $n+x$ ,  $n$  being a desired minimum number of copies of the data object and  $x$  being a maximum additional number of copies of the data object.

20. The method of claim 18 wherein said deleting comprises:

determining an attribute of each storage location containing a copy of the data object;  
selecting the copy of the data object based on the attribute of the storage location containing the data object; and  
deleting the selected copy of the data object.

21. The method of claim 20 wherein the attribute comprises at least one of storage space data, size of the stored data object, last accessed time of the data object, number of accesses of the data object, or local geographic information.

22. The method of claim 18 further comprising calculating  $x$ , said calculating comprising determining the geographical location of the storage location.

23. A method of managing a data object in a network comprising:

determining a plurality of storage locations in a network containing the data object; and  
deleting the data object at each determined storage location.

24. The method of claim 23 further comprising broadcasting a deletion message to all storage locations via a multicast protocol.

25. The method of claim 24 wherein said multicast protocol is Protocol Independent Multicast-Sparse Mode (PIM-SM).

26. A method of managing a data object in a network comprising:

receiving a request to access a data object from a user site;

generating a copy of the data object; and  
storing the generated copy of the data object at a storage location wherein the storage location is within a predetermined distance from the user site.

27. The method of claim 26 further comprising after said generating step:

determining the number of a plurality of storage locations in the network containing a copy of the data object;  
obtaining a desired minimum number of copies of the data object;  
selecting a storage location in the network containing a copy of the data object; and  
deleting the copy of the data object at the selected storage location if the actual number of storage locations containing a copy of the data object is greater than the desired minimum number of copies.

28. The method of claim 27 wherein said selecting comprises determining an attribute of the storage locations containing a copy of the data object.

29. The method of claim 28 wherein the attribute comprises at least one of storage space data, size of the stored data object, last accessed time of the data object, number of accesses of the data object, or local geographic information.

30. A server for maintaining information on data in network nodes, the server comprising:

a node table for storing node information;  
a node distance table for storing distance information between nodes;  
an object copy table for maintaining data copy information; and  
an object data and rules table.